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| **Faculty of Sciences and Mathematics, UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty** |  |
| **GENERAL INFORMATION** |
| Study program  | **PhD** |
| Study Module (if applicable) |  |
| Course title | The selected chapters of theoretical chemistry  |
| Level of study | ☐ Bachelor ☐ Master’s ☒ Doctoral |
| Type of course | ☐ Obligatory ☒ Elective |
| Semester  | ☐ Autumn ☒ Spring |
| Year of study  | Second |
| Number of ECTS allocated | 8 |
| Name of lecturer/lecturers | Ružica S. Nikolić, Nikola D. Nikolić |
| Teaching mode | ☐ Lectures ☐ Group tutorials ☒ Individual tutorials☐ Laboratory work ☒ Project work ☒Seminar☐ Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| *Introduction with the importance of chemical bonding and structure of the molecules in chemistry as well as chemical bonding in some more complex molecules. Understanding the formation of the molecules, elements and compounds; predicting the properties of chemical species and technique for their examination by the type of the chemical bond.* |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Fundamentals of wave mechanics, wave function and wave equation. The atomic orbitals *s, p, d, f.* Energy states of atoms and spectral terms. The chemical bond and molecular orbitals. Symmetry of the molecules and symmetry of atomic and molecular orbitals. Valence bond theory. Ionic bonding. Molecular crystals, structure of metals, and intermolecular interactions. Classification of molecules according to the characteristics of symmetry. Application of molecular symmetry in molecular spectroscopy. |
| **LANGUAGE OF INSTRUCTION** |
| ☒ Serbian (complete course) ☐ English (complete course) ☐ Other \_\_\_\_\_\_\_\_\_\_\_\_\_ (complete course)☐Serbian with English mentoring ☐Serbian with other mentoring \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **ASSESSMENT METHODS AND CRITERIA** |
| **Pre exam duties** | **Points** | **Final exam** | **points** |
| **Activity during lectures** | **20** | **Written examination** |  |
| **Practical teaching** |  | **Oral examination** | **40** |
| **Teaching colloquia** | **40** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |